“The Skulls of Murderers”
by Doctor Arthur Bordier
&
“The Skulls of Malefactors”
by Doctor Léon Ardouin

ANTHROPOLOGY SOCIETY OF PARIS
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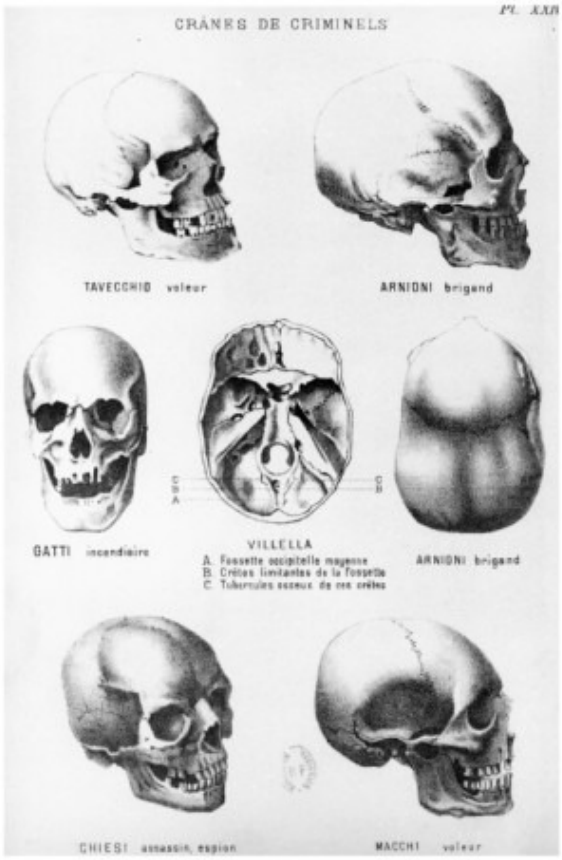

The skulls of criminals frequently display pathological lesions, a weakly-developed frontal region, and other anomalies, all of which leads one to conclude that a criminal is ***born***, not made.

The Skulls of Murderers

Messieurs, displayed in the Caen Museum's showcase during the recent Anthropology Exposition were thirty-five skulls of murderers who were guillotined for their crimes. In addition, one other skull, that of the celebrated Lacenaire, was exhibited by the Orfila Museum. In examining these skulls, I discovered numerous traces of pathological lesions highly deserving of attention; these form the subject of the second part of my talk today. Now, before making this interesting discovery, I conducted an anthropological study of these skulls utilizing processes that I have ordinarily applied to skulls emanating from various parts of the globe. Here are the results of this study.

ANTHROPOLOGICAL CHARACTERISTICS

Skull volume. – The skull of murderers is quite voluminous; using Broca's cubature process, I found their average to be 1,548 cubic centimeters even after I had eliminated the maximum-sized skull whose volume, evidently pathological, measured 2,076 cubic centimeters (cc).

The following table, messieurs, shows the results of my measurements respecting skull volume:

Out of 100 skulls belonging to each category, the percentage corresponding to each measure.

	West Cemetery	Murderers
1300 to 1400 cc	21.87%	11.42%
1400 to 1500 cc	18.75%	14.28%
1500 to 1600 cc	43.75%	28.57%
1600 to 1700 cc	3.12%	22.85%
1700 to 1800 cc	6.25%	16.66%
1800 to 1900 cc	3.12%	2.77%
1900 to 2000 cc	3.12%	0.00%
2000 to 2100 cc	0.00%	2.77%

You can see, messieurs, that the skull volume of the murderers is generally more than that of the individuals interred in the West Cemetery.

Ought one therefore to conclude that murderers are often more intelligent than honest people? This, indeed, would be a sufficiently distressing conclusion. Fortunately, a more detailed study reveals that this is not the case. In addition to the data obtained from the curvature of the skull, what results from an examination of the pieces is that it is, undoubtedly, a pathological action, such as cerebral sclerosis (development of cerebral cellular tissue at the expense of the brain's cells and fibers), which perhaps is responsible for this considerable volume—at least for some individuals of the series. Be that as it may, one might conclude from the preceding that, in general, the murderers I examined had a more developed skull than the skulls I compared them to, and that in order to find analogues to this series one ought to go back to the prehistoric era.

The horizontal circumference presents less accentuated differences, though in the same sense. On average it is 52.39 centimeters. One must go back in time to Cro-Magnon man and the Solutrean Period in order to find a higher average. I have compared these measurements to those that Doctor Le Bon found among different classes of Parisian society. The measurements of Doctor Le Bon have been taken on the living, mine on the dry skull; it is by way of calculation that I have been able to compare my measurements to those that had been taken on the living. To this end I availed myself of the empirical formula devised by Doctor Broca (it consists of adding 29.26 millimeters to the measurement taken on the skull).

Here is the table where you can see the comparison between the numbers.

Comparative Horizontal Circumference

Horiz. Circum. In centimeters	Savants	Middle class persons	Nobles	Domestics	Murderers
51-52	0.0	0.0	0.0	0.0	5.55
52-53	0.0	0.6	0.0	1.8	8.33
53-54	2.0	1.9	3.7	5.4	13.80
54-55	4.0	6.2	9.2	5.4	**25.00**
55-56	6.0	14.0	12.8	33.9	13.80
56-57	18.0	**24.0**	**28.5**	42.8	16.60
57-58	**36.0**	**24.5**	22.0	10.7	11.11
58-59	18.0	14.0	12.0	0.0	0.00
59-60	8.0	7.0	8.0	0.0	2.61
60-61	6.0	3.3	1.8	0.0	2.61
61-62	2.0	1.8	0.0	0.0	0.00
62-63	0.0	0.7	0.9	0.0	0.00
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	100.0	98.0	98.9	100.0	96.41

Now, this distribution is remarkable; it shows us that the horizontal circumferences of the savants group themselves around 57 to 58 centimeters. For the middle class persons you can see that this grouping is less plainly divided; likewise the nobles' horizontal circumferences seem less well divided. For domestics they are rather grouped around 55 to 57 centimeters. Lastly, the murderers present a grouping whose range is below that of the domestics.

Cephalic index. – The average cephalic index of these murderers is 78.23. They are therefore mesocephalic; but, they are more dolichocephalic than the skulls of the West Cemetery (79.14) or than the ones found in both the Cemetery of the Innocents (78.94) and in the Cemetery of the Cité (78.58). However, they are less dolichocephalic than the Merovingians (77.01). Now, these findings are quite opposite from the conclusion reached by Professor Lombroso, who regards murderers as being either brachycephalic or microcephalic. I have found that the skulls of the murderers I studied are neither of these.

Subcerebral curve. – The murderers that I examined had very developed superciliary ridges. Gall placed at this level the *sense of locality*; he added that many persons endowed with very prominent superciliary ridges will be found to possess a fickle, nomadic, and adventurous temperament.

Be that as it may, it is necessary to go all the way back to the Solutrean Period in order to find skulls having superciliary ridges approaching, though still falling short of, those of the murderers (2.63 millimeters). If, instead of considering absolute totals, one only troubles oneself with the ratio of these numbers to the entire antero-posterior curve of the head, one finds it to be 7.32% for the murderers; this is a huge ratio, which is similar only to the one found for the Merovingians.

Frontal curve. – The frontal curve is more deficient among the murderers than with any present or past race of our country. This result is arrived at whether one compares the absolute numbers (111 millimeters on the skulls of the West Cemetery, more than 100 with all the others, and 99.8 with the murderers) or whether one only considers the ratio of this curve to the entirety of the skull circumference (26.9% with the murderers, 29% for the Middle Ages and present day, and 27-28% for prehistoric times).

So, the craniometric paradox that I pointed out a few minutes ago can now be explained; for we see that, with murderers, their large cranial capacity does not signify considerable intelligence because, on the contrary, the region where the higher faculties of man reside is atrophied in them.

Anterior semicircumference. – You will hit upon an analogous result, messieurs, when you consider the anterior semicircumference of the skull. For when one studies this curve, one finds that over the period from the cave-dwelling days of Cro-Magnon man till now it grew 45% to more than 48% (the total circumference of the skull being 100%).

Parietal curve. – In the parietal region the skulls of the murderers make up for and beyond what they have less of in the frontal region. This curve forms with them 34.41% of the total curve, a ration more considerable than what skulls of the Middle Ages or modern era possess, but it is very similar to what one finds in Stone Age skulls.

It is particularly notable that the corresponding region of the brain (this is the part above the frontal convolutions and intraparietal) is regarded as the seat of the motor centers; this region, in fact, is where Doctor Mierzejewski viewed atrophy in an apathetic microcephalic, and, on the other hand, hypertrophy in agitated persons.

In short, less of the frontal region and more of the parietal region will therefore signify less reflection and more action; this is true as much with the prehistoric savage as with a present-day murderer. And, messieurs, aren't these two qualities, in fact, probably common to them?

Occipital curve. – In general (and aside for two exceptions), the occipital part of the circumference of the head of the murderers approaches that which is observed in other men.

Vertical height. – On average the vertical height of the murderers' skulls surpasses by a little that of the Auvergnats, skulls of which I have measured in the anthropology laboratory (135.9 millimeters versus 130.4 millimeters).

Stephanic index. – This index is elevated in the skulls of the murderers, as my table indicates. The maximum width of the forehead (upper diameter) is therefore smaller among the murderers than with the others (various present-day classes of Parisian society). On the other hand, the lower diameter (nonintellectual, but osseous) is somewhat larger with them.

Frontal index. – The frontal index of the murderers is raised (70.36); a more exact analysis shows that this result is due, not to the shape of their forehead, but to the reduction of the transverse diameter.

Simplicity of the frontal suture. – In 25% of the cases I found the murderers' frontal suture to be either hardly or not at all scalloped.

Now, from all these measurements one is permitted to conclude that the average of the murderers presents a notable intellectual inferiority; this lack of intelligence among them is so much the more perceptible that the tendency to motor action, activity, and excitation correspondingly appears more considerable.

The murderers that I studied were therefore born with qualities that characterized prehistoric races, qualities which have disappeared in present-day races, but which sometimes reappear by a sort of atavism.

The criminal, thus understood, is an anachronism—a savage in civilized lands, a kind of monster, and something comparable to an animal who, being the offspring of generations of domesticated, tamed, and work-habituated forefathers, abruptly appears with the indomitable savagery of its first ancestors. Among domesticated animals you see examples of this genre; these restive, unmanageable, and contumacious animals are the criminals.

Indeed, today's criminal has made his appearance too late; more than one, in the prehistoric era, would have been a respected chief of his tribe.

In sum, we are right in thinking that one is *born* criminal. The next part of my talk, messieurs, will demonstrate that one may also *become* one; it revolves, in effect, around the pathology of the skulls of criminals. I should mention that my findings in this area I presented as well to the Congress of Anthropological Sciences last year.

Now, it turns out that the skulls of criminals are very frequently subject to lesions, as you see in the following small table. Among the skulls of criminals examined, I found:

Normal skulls	3	8.33%
Abnormal skulls, but not plainly pathological	12	33.33%
Pathological skulls	31	58.33%

The anomalies observed are: asymmetry, the projection of the occipital, and also the projection of the frontal.

The pathological characteristics are: a lesion at the suture, ossification troubles at the occipito-parietal suture, eburnation of the sagital, total eburnation, bone injury, displacement of bone, loss of substance, etc.

This skull pathology study of mine ensued as a result of my making a certain number of observations analogous to those that the doctor makes at the bedside of a sick person. What I did was note the life and crimes of a murderer as described in the *Tribunals Gazette*, and then I compared to these sad histories the description of the diverse lesions identified in the same guillotined murderer.

Naturally, heredity plays an important role in the etiology of crime. However, it is likely that a proper education will correct the child who is born with a tendency to commit crime; and will above all prevent the development of this wretched disposition.

The Skulls of Malefactors

Messieurs, in my capacity as a Physician (1st Class) in the Navy, I have been able to take measurements on the skulls of a number of convicts executed in 1849 at Rochefort Prison. Today I shall share with you my findings. Now, the convicts whose skulls I measured were: sixteen murderers, four robbers, four rapists, a poisoner, and one sort of evildoing hydrocephalous and idiot madman.

In general, the results I obtained coincide with those pertaining to murderers that Doctor Bordier presented to the Society at our April 17th meeting last Spring. In my study I used mustard seed to cube the convicts' skulls, and like Doctor Bordier I found the murderers possessing a considerable cranial capacity. Here now are the results I obtained:

	Cranial capacity (cubic centimeters)
The murderers	1654
The robbers	1627
The rapists	1593

The other measurements that I took on these skulls differed from the usual averages in the same way the measurements of Doctor Bordier indicated.

Here are some additional measurements I obtained, which I have placed in a table that compares them to those taken by Doctor Bordier and to ones obtained from skulls of the West Cemetery.

	West Cemetery	**Bordier**	**Ardouin**
Subcerebral region	1.8	2.63	1.90
Frontal region	11.09	9.90	9.70
Parietal region	12.70	12.70	12.50
Occipital region	11.90	11.70	11.90

As you can see, the subcerebral region, which Doctor Bordier has observed to be strongly developed in murderers, is notably less considerable in the more mixed society that I studied; nevertheless, even in the convicts whose skulls I measured, it is rather more elevated than the average. My findings do, however,

coincide with Doctor Bordier's with regard to the development of the frontal region, which both of us found to be much more weakly developed than in the average person. By contrast, the parietal and occipital regions deviate little from the average.

Finally, by utilizing the profile-taking instrument Doctor Le Bon invented and described to us last year, I have been able to make accurate drawings of the profile of each skull I measured. These drawings, messieurs, are available for your review, along with the biography of several of this study's scoundrels.